MANUFACTURER DATA SHEET

Discrete I/O

Manufacturer:

Allen-Bradley/Rockwell

Model Number:

1746 Series

See www.geomartin.com for additional PDF datasheets

Martin Part Number:	VendorPartNumber:
E-014624-02	AB # 1746-IA8, AC Input, 8 Point
E-014624-03	AB # 1746-IOA16, AC Output, 16 Point

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Discrete I/O Modules

(Catalog Number 1746 Series)

Installation Instructions

Input Module Catalog Numbers:
1746-IA4, -IA8, -IA16, -IB8, -IB16, -IC16, -IG16, -IH16, -IM4, -IM8, -IM16,
-IN16, -ITB16, -ITV16, -IV8, -IV16

Output Module Catalog Numbers:
1746-OA8, -OA16, -OAP12, -OB8, -OB6EI, -OB16, -OB16E, -OBP8,
-OBP16, -OG16, -OV8, -OV16, -OVP16, -OW4, -OW8, -OW16, -OX8

Combination Input/Output Module Catalog Numbers:
1746-IO4, -IO8, -IO12, -IO12DC

Publication 1746-IN005A-US-P

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for purposes of example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI-1.1, *Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control* (available from your local Allen-Bradley office), describes some important differences between solid-state equipment and electromechanical devices that should be taken into consideration when applying products such as those described in this publication.

Throughout these installation instructions we use notes to make you aware of safety considerations:

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention statements help you to:

- identify a hazard
- avoid the hazard
- recognize the consequences

IMPORTANT: Identifies information that is critical for successful application and understanding of the product.

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Recovery From Blown Fuse/Processor Fault/Processor Shutdown

Processor operation will stop under the following conditions:

- The output module fuse blows due to a short circuit.
- JP1 is set to the Processor Faults position (pins 2 and 3 connected).

If the above conditions occur, the following procedures should be used for recovery:

1. Follow fuse replacement procedures shown on page 39.
2. Clear the processor major fault bit S:1/13.
3. Clear processor status file S:6 major error code (optional).
4. Return processor to Run Mode.

For additional information on processor fault codes and clearing processor fault bits, refer to the following user manuals:

- Your programming device's reference manual
- *HHT User Manual*, publication 1747-NP002

  Chapter 28, Troubleshooting Fault

  Chapter 29, Understanding the Fault Routine

Replacement Fuse Recommendations

Use the following replacement fuses -

- 1746-OBP16/-OVP16 -Littelfuse #322010,10A. This fuse is required to maintain UL/CSA rating. Replacement Fuse Kit is catalog number 1746-F8. (5 fuses per kit).
- 1746-OAP12 -Use SAN-O HQ 6.3A for replacement. This fuse is required to maintain UL/CSA rating. Replacement Fuse Kit is catalog number 1746-F9 (5 fuses per kit).

Fuse Replacement Procedure

To replace a blown fuse:

ATTENTION: Never install, remove, or wire modules with power applied to chassis.

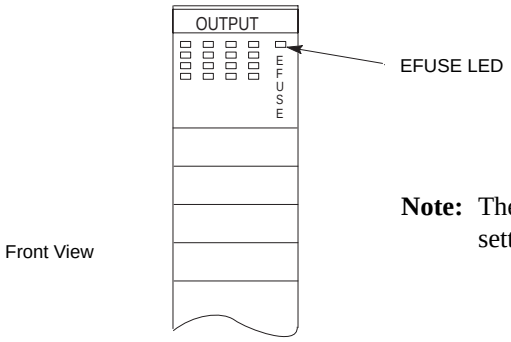
1. Remove SLC 500 system power and correct the conditions causing the short circuit.
2. Remove the output module from the chassis.
3. Remove the fuse.
   - 1746-OBP16/-OVP16: Use a wide tipped, slotted head screw driver to remove the blown fuse. Slide the screw driver tip under the fuse and use a twisting motion to pry the fuse from the fuse clip. Use care so that the printed circuit board and surrounding electronics are not damaged.
   - 1746-OAP12: A fuse holder is provided with each fuse. Simply grasp the fuse holder with needle-nose pliers, or your fingers, and pull it out.
4. Replace the fuse.
   - 1746-OBP16/OVP16: Center the replacement fuse over the fuse clip and press down. If a tool is used to press the fuse in place, apply pressure to the metal end caps only, not the center of the fuse.
   - 1746-OAP12: Insert a new fuse into the fuse holder, align fuse holder on fuse clips and press down.
5. Replace the output module in the chassis.
6. Restore SLC 500 system power. Clear processor fault bits as indicated in the steps provided on page 38.

Electronically Protected Modules (1746-OB6EI and -OB16E)

Electronic Protection

The electronic protection of the 1746-OB6EI and -OB16E has been designed to provide protection for the modules from short circuit and overload current conditions. The protection is based on a thermal cut-out principle. In the event of a short circuit or overload current condition on an output channel, that channel will limit current within milliseconds after its thermal cut-out temperature has been reached. All other channels continue to operate as directed by the CPU (processor) module.

IMPORTANT: The modules do not provide protection against reverse polarity wiring or wiring to AC power sources. Electronic protection is not intended to replace fuses, circuit breakers, or other code-required wiring protection devices.



Note: There is no jumper setting on this module

Auto Reset Operation

IMPORTANT: The 1746-OB6EI and -OB16E perform auto-reset under overload conditions. When an output channel overload occurs as described on page 40, that channel will limit current within milliseconds after its thermal cut-out temperature has been reached. While in current limit, the output channel can cool below the thermal cut-out temperature allowing the module to auto-reset and resume control of the output channel as directed by the processor until the thermal cut-out temperature is again reached.

Removing power from an overloaded output channel would also allow the output channel to cool below the thermal cut-out temperature, allowing auto-reset to occur when power is restored. The output channel would operate as directed by the processor until the thermal cut-out temperature is again reached.

To avoid auto-reset of an output channel under overload conditions, an external mechanical fuse can be used to open the circuit when overloaded.

Short Circuit/Overload Current Diagnostics

If a short circuit or overload current condition occurs on an output channel:

1. The E-Fuse LED will illuminate provided that power is applied to the module. Power required: 5V dc via backplane and load power via an external supply.
2. All other channels continue to operate as directed by the CPU (processor) module.

Recovery From Channel Shutdown

1. Remove the SLC 500 system power and correct the conditions causing the short circuit or overload current condition.
2. Restore the SLC 500 system power. The module automatically resets and resumes control of the output channel and associated load.

Wiring Diagrams

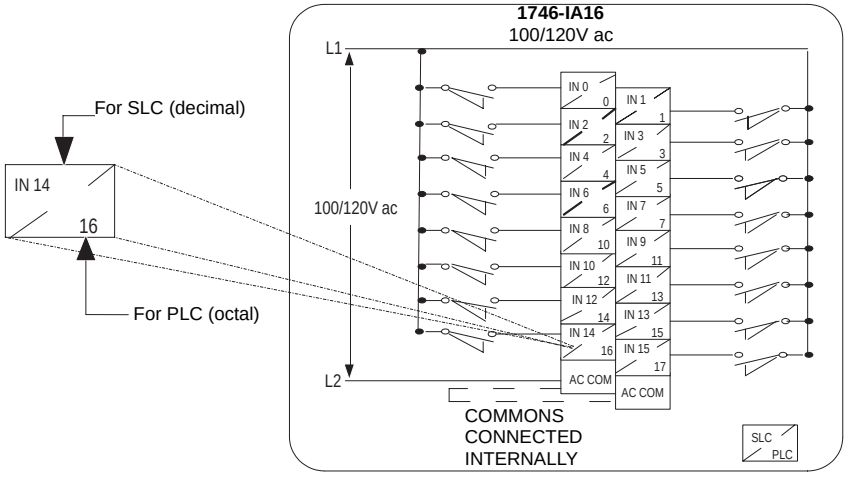
The wiring diagrams in these installation instructions are examples only. It is not necessary to connect an I/O device to each and every I/O module terminal.

Labeling for SLC/PLC® Systems

In this document, 16-point I/O module wiring diagrams include both decimal and octal numbers for I/O addressing and wire identification (see figure below). To wire your 16-point I/O module when used in a SLC system, use the decimal numbers in the upper left portion of each box. When used in a PLC system, use the octal numbers in the lower right portion of the box. *As shipped from the factory, the I/O module has a decimal address label on the inside of its door.* An octal label kit should be included with your 16-point I/O modules, or a separate octal conversion kit can be ordered, to allow you to convert your module to the octal system.

IMPORTANT: Ensure the octal labels are used with your PLC system. Directions on how to install the labels are included with the kit and on page 30 of this document.

Figure 6:Decimal and Octal Labeling for 16-Point I/O Modules



Input Modules - ac

Figure 7:Wiring Diagrams (1746-IA4, -IA8, -IA16)

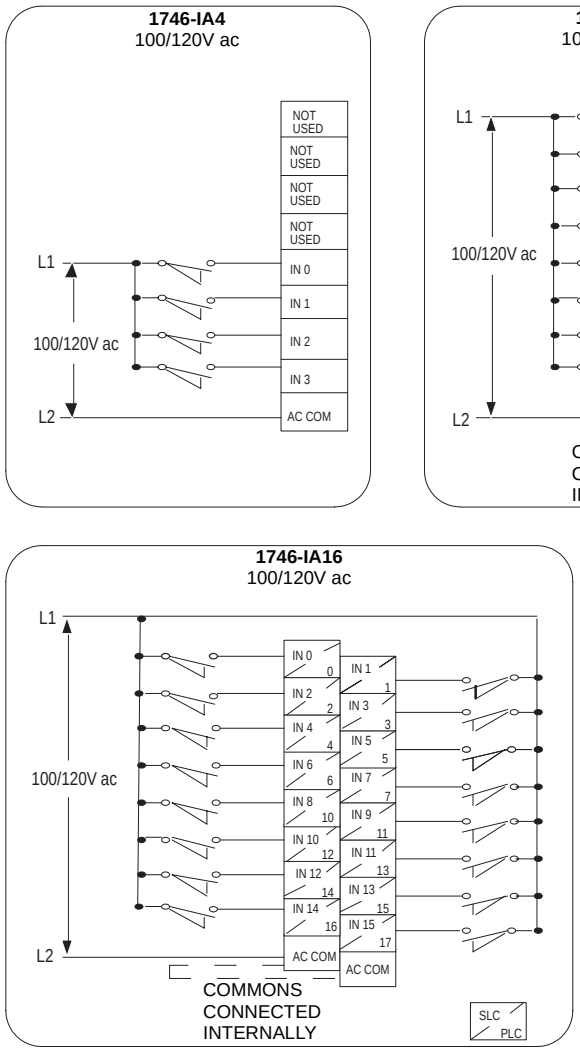
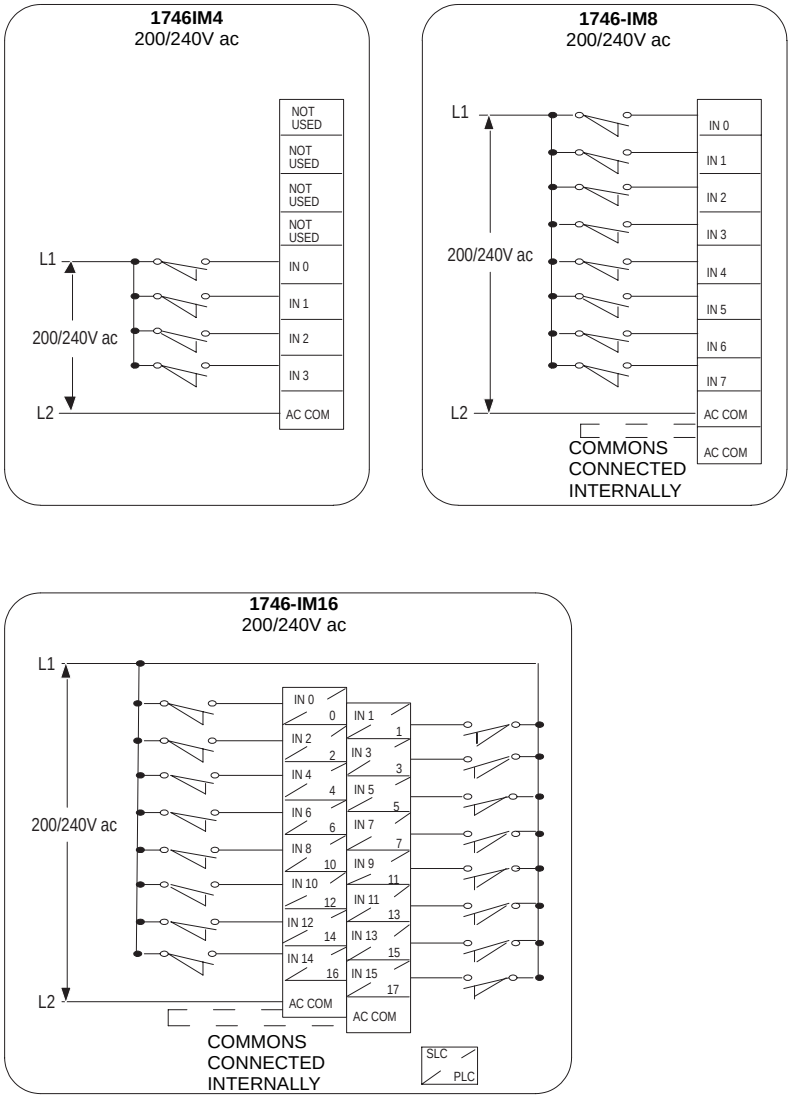


Figure 8:Wiring Diagrams (1746-IM4, -IM8, -IM16)



Input Modules - dc

Figure 9:Wiring Diagram (1746-IN16)

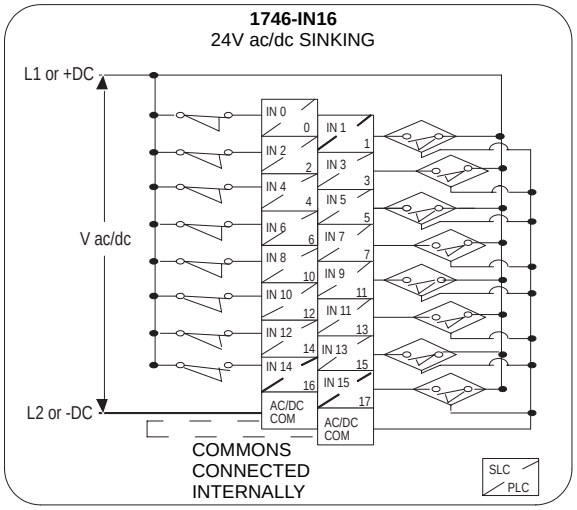


Figure 10:Wiring Diagram (1746-IB8, -IB16, -ITB16, -IC16, -IH16)

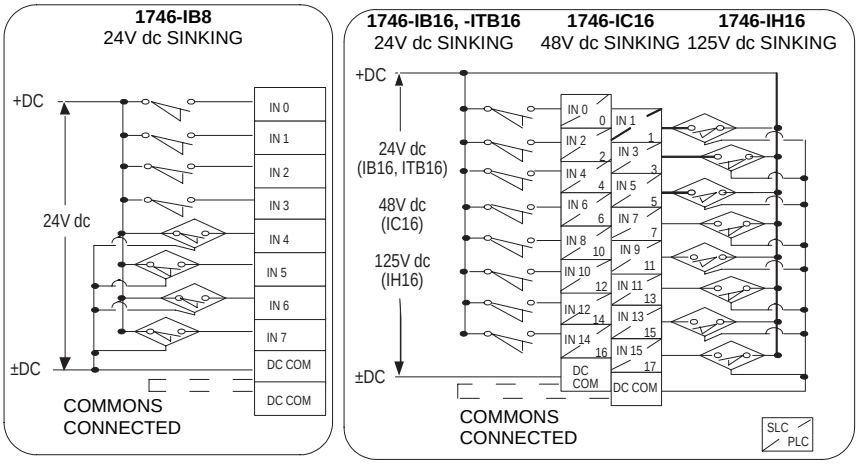


Figure 11:Wiring Diagram (1746-IV8, -IV16, -ITV16)

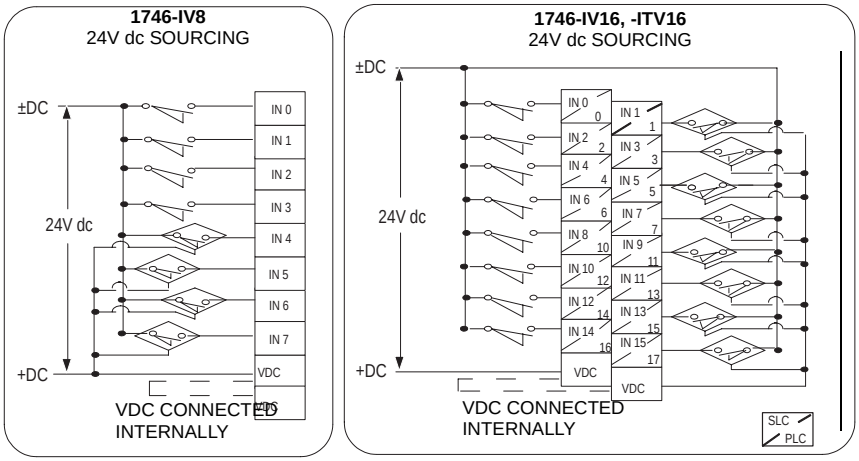
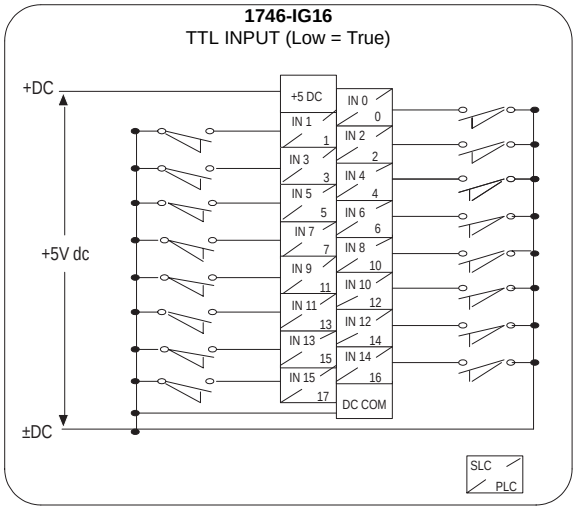
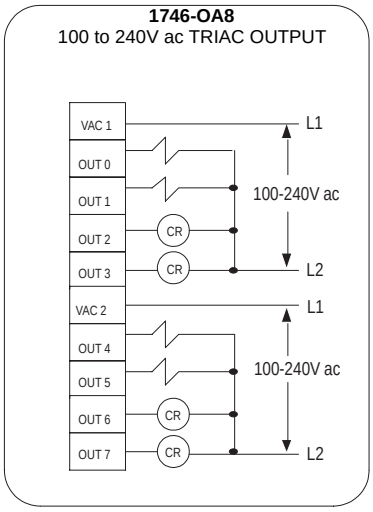


Figure 12:Wiring Diagram (1746-IG16)



Output Modules - ac

Figure 13:Wiring Diagrams (1746-OA8, -OA16)



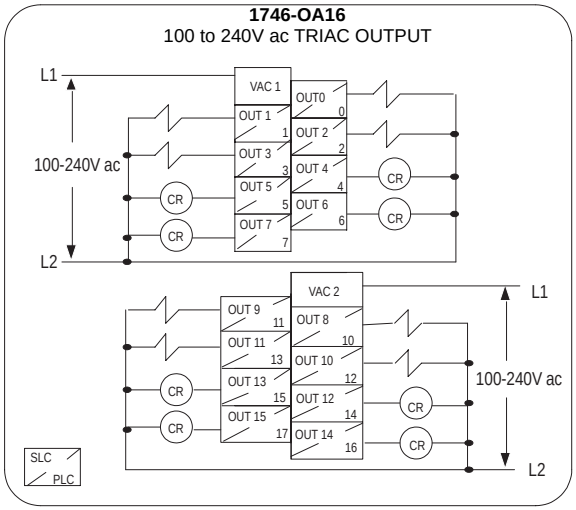
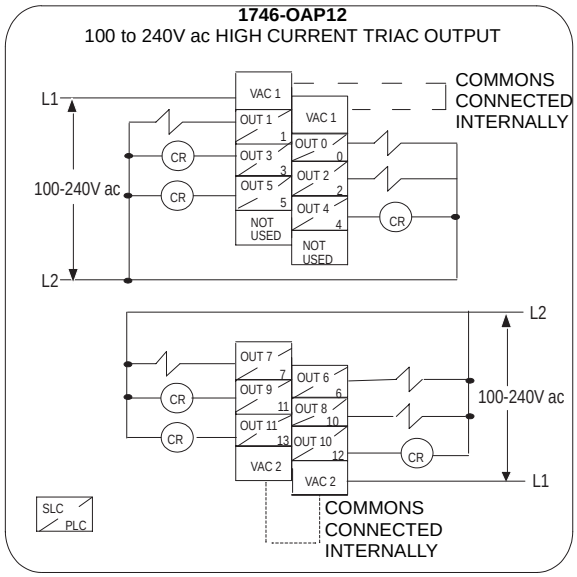


Figure 14:Wiring Diagram (1746-OAP12)



Output Modules - dc

Figure 15:Wiring Diagrams (1746-OB6EI)

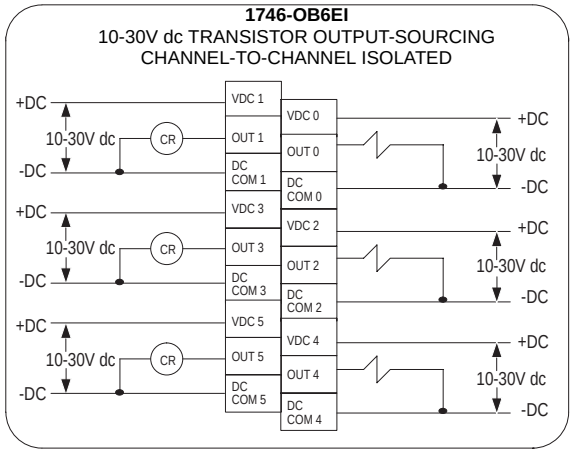


Figure 16:Wiring Diagrams (1746-OB8, -OBP8, -OB16, -OB16E, -OBP16)

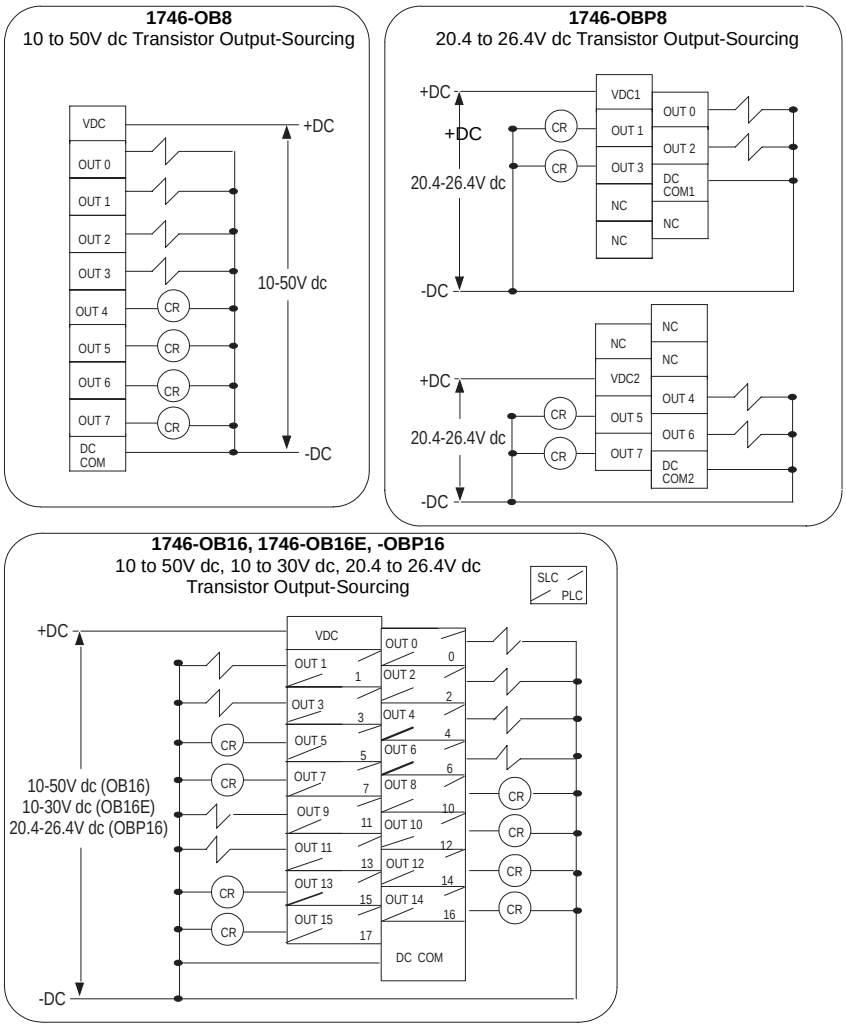
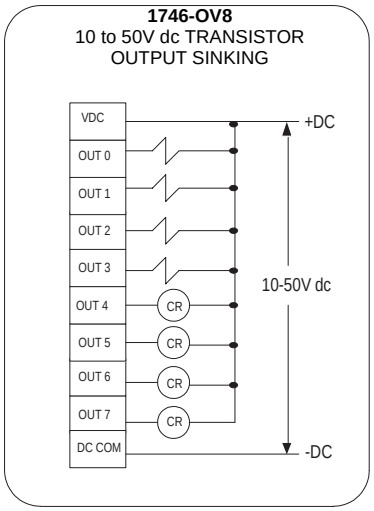


Figure 17:Wiring Diagrams (1746-OV8, -OV16, -OVP16)



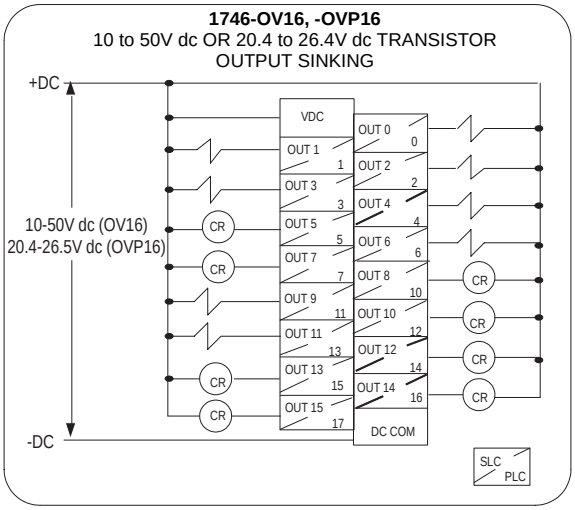
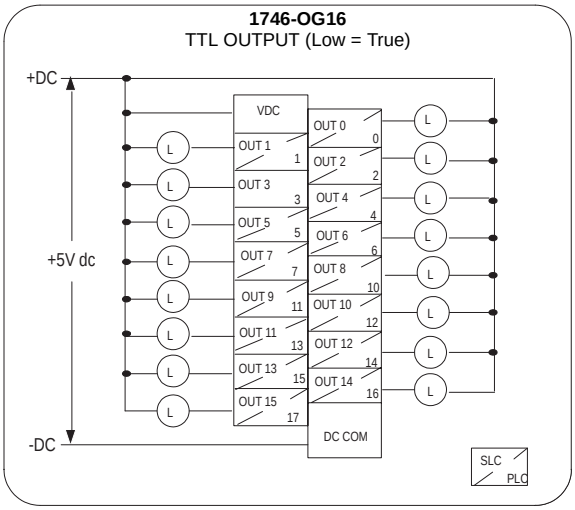
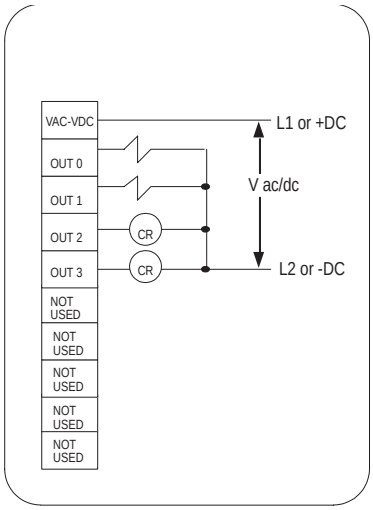


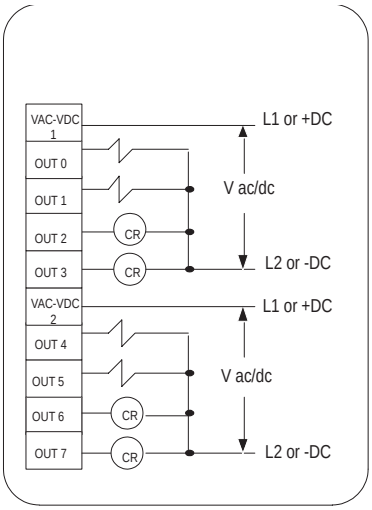
Figure 18:Wiring Diagrams (1746 -OG16)



Relay Contact Output Modules

Figure 19:Wiring Diagrams (1746 -OW4, -OW8, -OW16)





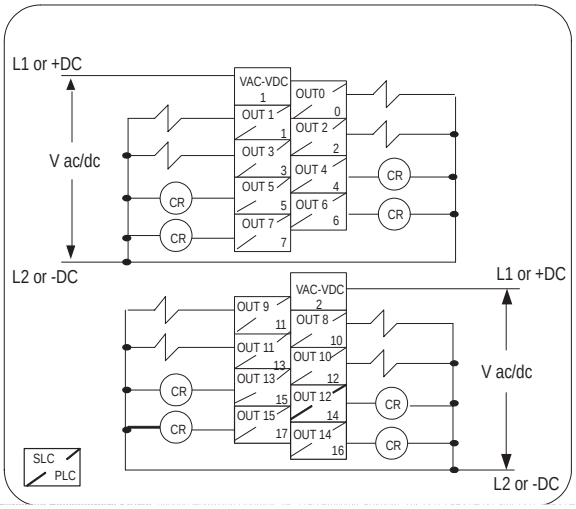
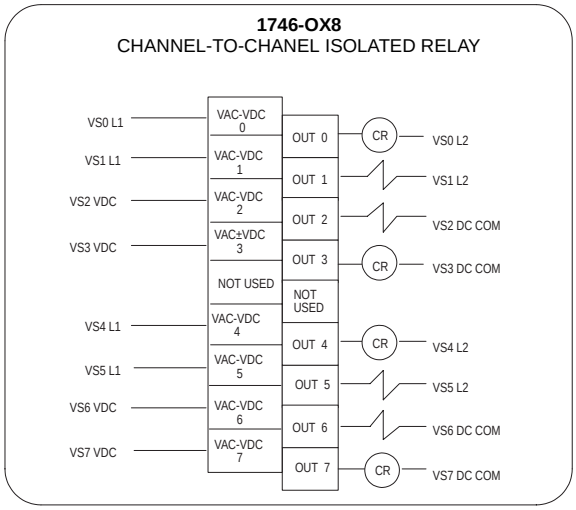
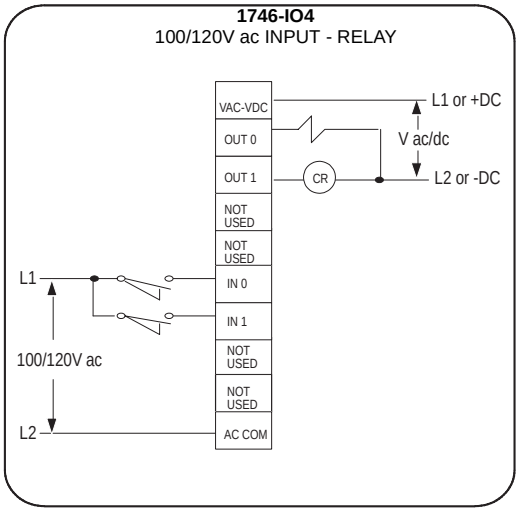


Figure 20:Wiring Diagram (1746-OX8)



Input/Output Combination Modules

Figure 21:Wiring Diagram (1746-IO4, -IO8)



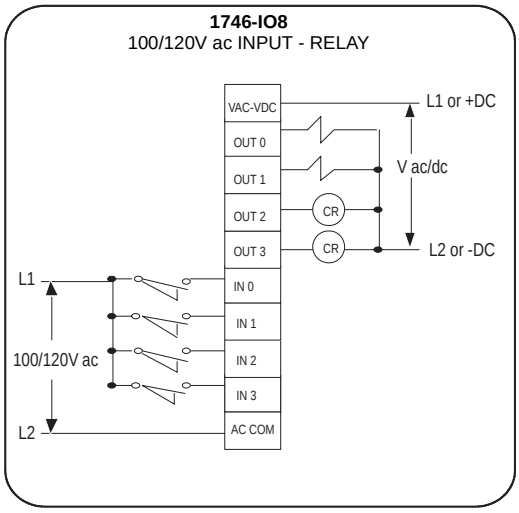


Figure 22:Wiring Diagram (1746-IO12)

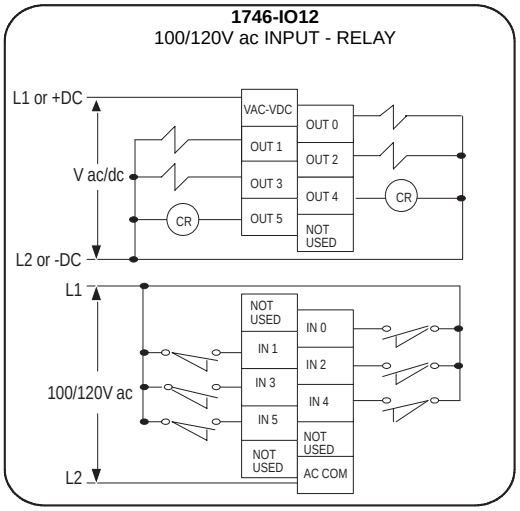
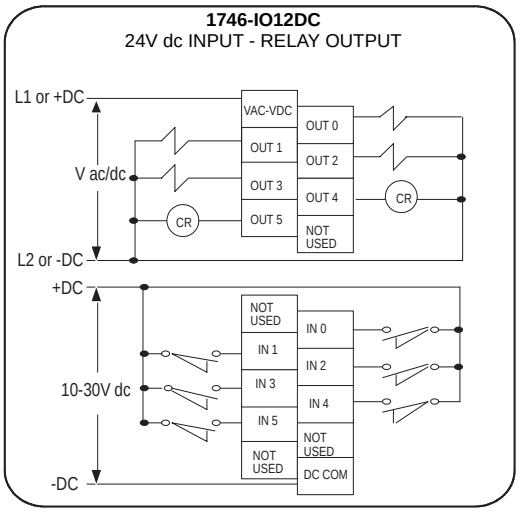


Figure 23:Wiring Diagram (1746-IO12DC)



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